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its organs. It is a complete fac-simile of the larva made up of fungus growth. This may be called a resting or storage organ. This requires time to ripen. It may send up an orange-colored club-shaped body as in figure 190 or it may produce a dense growth of threads resembling a small ball of cotton and from these threads another kind of spores is produced. This new kind of spore affects the larva in the same way as the kind already described. The caterpillar will continue to move sluggishly for some distance after it has been thus infected. The caterpillar fungus is of great economic value for thousands of larvae are killed in this way every year.

One of the largest forms of the caterpillar fungi is COR'-DY-CEPS HER-CU'-LE-A Schw. An excellent representation is given in the half tone. figure 190. It is called *herculea* because of its large size. The species can be readily identified from this cut. It grows from the body of a large white grub found on rotten wood. A perfect form of the grub is retained yet every bit of the larva has been coverted into fungus starch for storage material.

The plant is quite large, clavate in form, head oblong, round, slightly tapering upward with a decided protuberance at the apex as will be seen in the half tone. The head is a light yellow in all specimens I found, not alutaceous as Schweinitz states, nor is the head obtuse. They are found in August and September.

◆

USE OF MUSHROOMS.

Geo. F. Atkinson, Cornell University.

Another very favorable indication accompanying the increasing interest in the study of these plants, is the recognition of their importance as objects for nature study. There are many useful as well as interesting lessons taught by mushrooms to those who stop to read their stories. The long growth period of the spawn in the ground, or in the tree trunk, where it may sometimes be imprisoned for years, sometimes a century, or more, before the mushroom appears, is calculated to dispel the popular notion that the mushroom "grows in the night." Then from the button stage to the ripe fruit, several days, a week, a month, or a year may be needed, according to the kind, while some fruiting forms are known to live from several to eighty or more years. The adjustment of the fruit cap to a position most suitable for the scattering of the spores, the different ways in which the fruit cap opens and expands, the different forms of the fruit surface, their colors and other peculiarities, suggest topics for instructive study and observation. The inclination, just now becoming apparent, to extend nature study topics to include mushrooms is an evidence of a broader and more sympathetic attitude toward nature.

A little extension of one's observation on the habits of these plants in

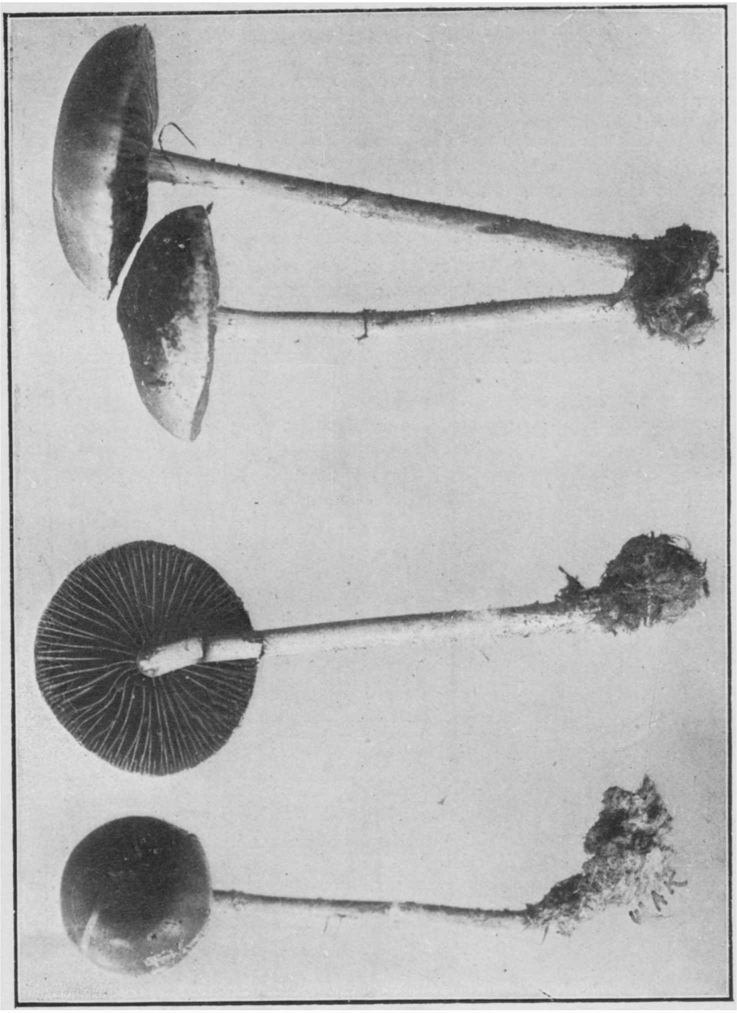

Fig. 191. PA-NAE'-O-LUS CAM-PAN-U-LA'-TUS.—See explanation at bottom of the page.

PA-NAE'-O-LUS.—This a genus of black-spored Agarics, somewhat resembling the species of Coprinus, but the gills not deliquescing or dissolving into ink as in case of the latter genus. The pileus is somewhat fleshy or thin and the margin even (not striate). The genus is further characterized as having gills not uniform in color, being clouded or spotted with black or brown colors, the edges of the gills often white in contrast. The stem is usually smooth.

The species shown on this page was collected near Columbus, Ohio; it grew from old horse dung in a pasture, the plants being few and scattered. McIlvaine says he has "several times eaten of this fungus in small quantities, because larger could not be obtained, and with no other than pleasant effect." But he advises caution because a case of poisoning from eating this species was reported in 1816 in the London Medical and Surgical Journal.

the woods will reveal the fact that certain ones are serious enemies of timber trees and timber. It is quite easy in many cases for one possessing no technical knowledge of the subject to read the story of these "wood destroying" fungi in the living tree. Branches broken by snow, by wind, or by falling timber provide entrance areas where the spores, lodging on the heart wood of broken timber, or on a bruise on the side of the trunk which has broken through the living part of the tree lying just beneath the bark, provide a point for entrance. The living substance (*protoplasm*) in the spawn exudes a "juice" (*enzyme*) which dissolves an opening in the wood cells and permits the spawn to enter the heart of the tree, where decay rapidly proceeds as a result. But very few of these plants can enter the tree when the living part underneath the bark is unbroken.

These observations suggest useful topics for thought. They suggest practical methods of prevention, careful forestry treatment and careful lumbering to protect the young growth when timber trees are felled. They suggest careful pruning of fruit and shade trees, by cutting limbs smooth and close to the trunk, and then painting the smooth surface with some lead paint.—Mushrooms, Edible, Poisonous, etc.

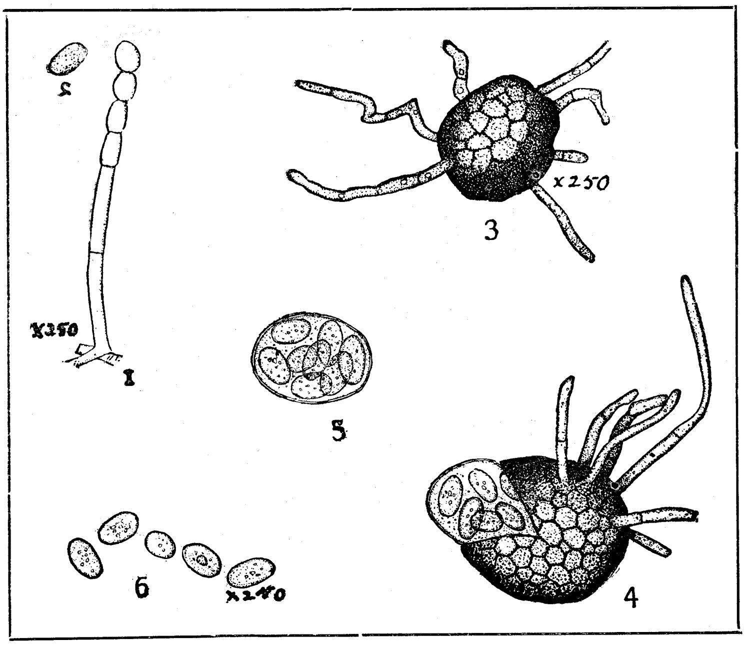

Fig. 192. Magnified figures of portions of the Leaf-mildew Fungus that causes (in conjunction with a mite) the Branch-knots or distortions on Hackberry trees, similar to Witches'-brooms, the latter shown in Figs. 193 and 194. Minute *spores* are shown at 1 and 2 which are produced early in the season, and later minute, scarcely visible, black spore-cases (shown at 3 and 4) are formed; these contain sacs (*asci*) of spores—eight in each sac or ascus (shown at 5); spores escaped from the ascus are shown (at 6). The botanical name of this microscopic fungus is *Sphae-ro-the'-ca phy-top-toph'-i-la.*

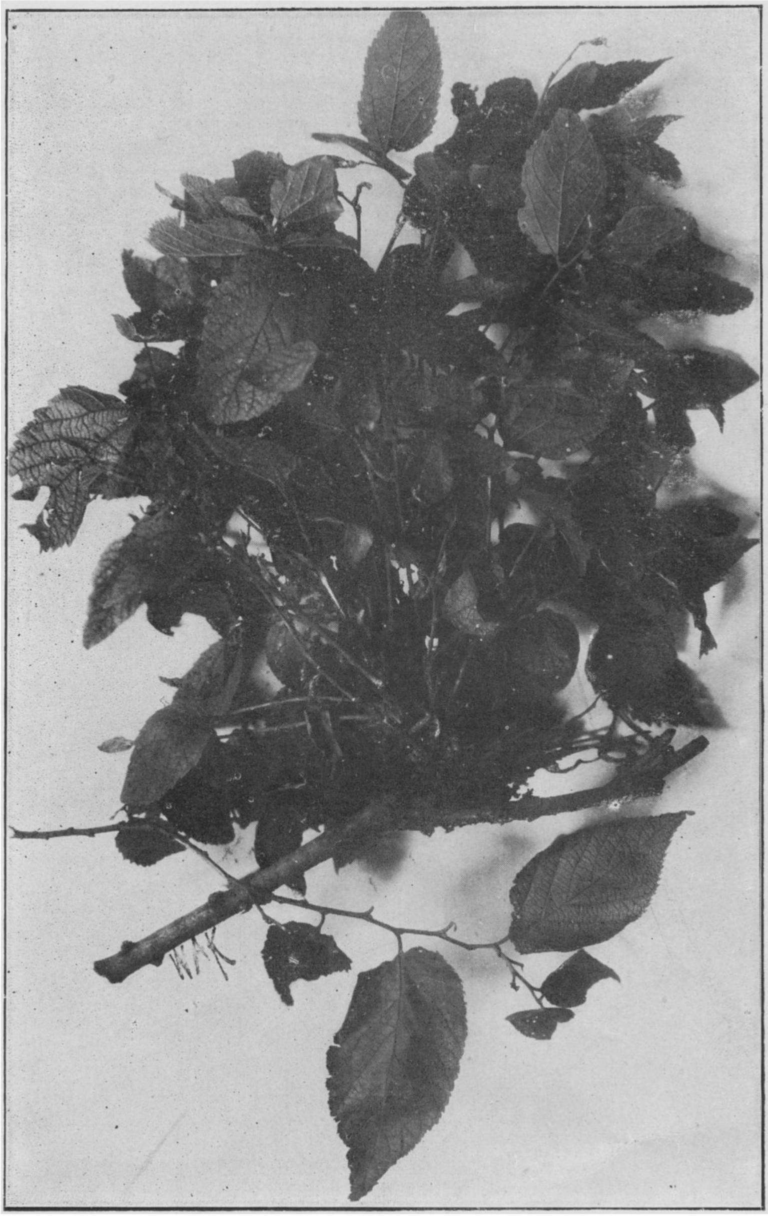

Fig. 193. **Branch-knot or Witches'-broom** of the Hackberry tree, caused by a small mite and a microscopic fungus.